

CLAIMS

We claim:

1. An apparatus for injecting a sample into a chromatographic column,
5 comprising:

a source of high pressure joined at a common junction to the inlet of the chromatographic column; and

a sample injector joined to the common junction, said sample injector comprising at least two elements combined in a series arrangement and
10 connected to a common power supply, wherein each element comprises a container having an inlet end and an outlet end, the container filled with a dielectric material forming a porous bed therein.

2. The apparatus of claim 1, wherein said high pressure source comprises an electrokinetic pump.

- 15 3. The apparatus of claim 1, wherein the porous dielectric material is comprised of a nonporous and uncoated material.

4. The apparatus of claim 3, wherein the dielectric material includes a glass, ceramic, or polymer material.

5. The apparatus of claim 4, wherein the dielectric material is silica beads.

- 20 6. The apparatus of claim 1, wherein the porous bed has a pore size in the range of about 25 to 300 nm.

7. The apparatus of claim 1, further including at least one salt bridge disposed between the electrodes of the power supply and the elements of said sample injector.

- 25 8. A method of injecting a sample into a chromatography column for

chromatographic analysis, comprising the steps of:

providing a flow of a running buffer to the chromatography column;

shutting off the flow of running buffer;

5 applying a voltage to a sample injector having a common junction with
the chromatography column to cause a sample to flow into the common
junction; and

starting the flow of running buffer to apply a pressure to drive the
sample contained in the common junction into and through the chromatography
column.

10 9. An apparatus for the high pressure injection of a sample into a
chromatography column, comprising:

a substrate fabricated to define a microchannel system disposed thereon,
the microchannel system comprising, in combination,

15 a source of high pressure joined at a common junction to the inlet
of the chromatography column; and

a sample injector joined to the to the common junction, said
sample injector comprising at least two elements combined in a series
arrangement and connected to a common power supply, wherein each element
comprises a container having an inlet end and an outlet end, the container
20 filled with a dielectric material forming a porous bed therein.

10. The apparatus of claim 9, wherein the source of high pressure is an
electrokinetic pump.

11. The apparatus of claim 9, further including at least one salt bridge
disposed between the electrodes of the power supply and the elements of said
25 sample injector.

12. The apparatus of claim 9, wherein the dielectric material comprising the porous bed is produced by lithographic etching.